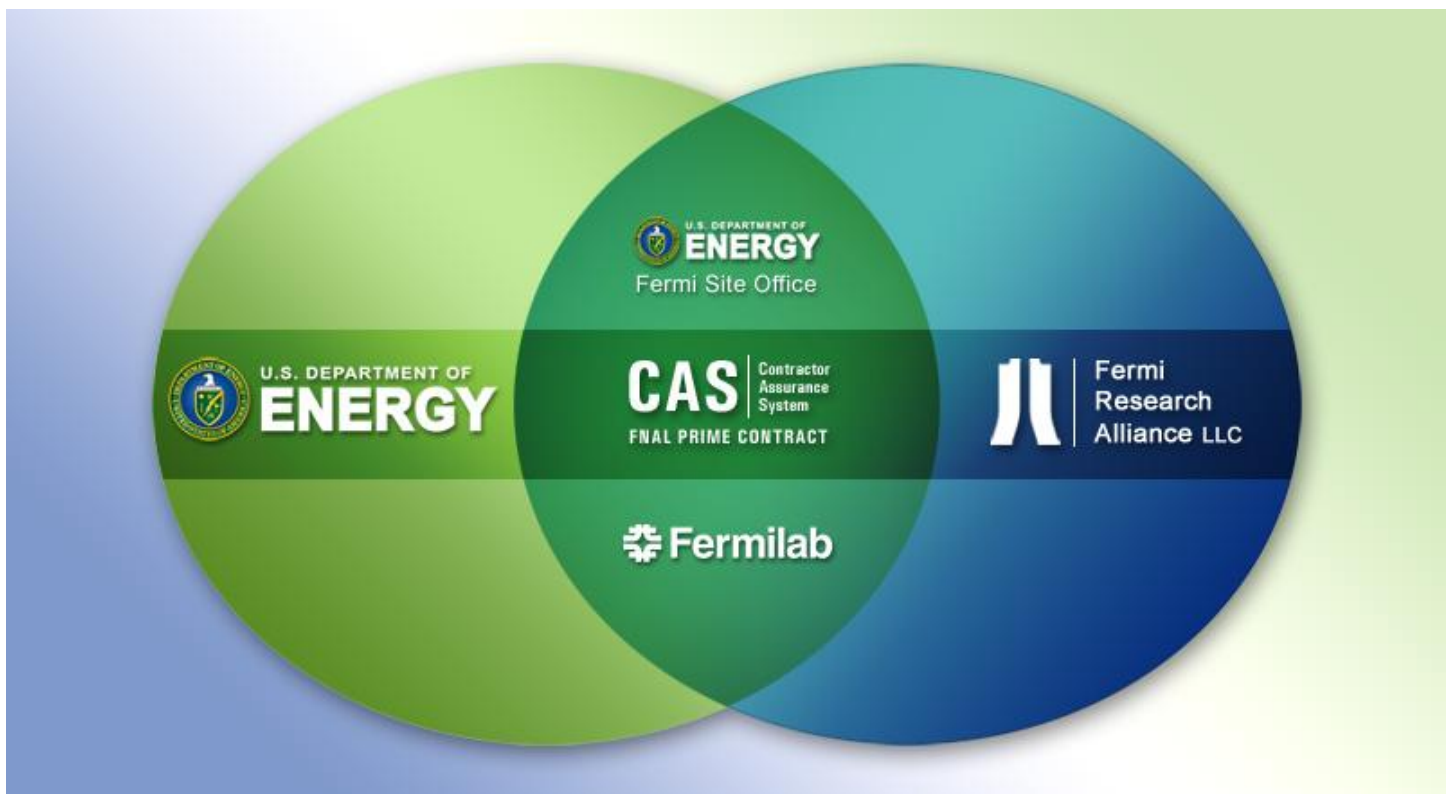




Contractor Assurance System Description



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Contents

1.0 INTRODUCTION	3
1.1 PURPOSE	3
1.2 SCOPE	3
2.0 ASSURANCE PROCESS.....	3
2.1 ROLES	4
2.2 CORPORATE GOVERNANCE	4
2.2.1 BOARD OF DIRECTORS.....	5
2.2.2 BOD COMMITTEES	5
2.3 EXECUTION OF CONTRACTOR ASSURANCE	7
2.4 PARTNERING	7
2.4.1 TIMELY AND APPROPRIATE COMMUNICATION	7
2.5 LABORATORY MANAGEMENT OF CONTRACTOR ASSURANCE	8
2.5.1 FERMILAB MANAGEMENT STRUCTURE	8
2.5.2 CONTRACTOR ASSURANCE AND MANAGEMENT SYSTEM INTEGRATION.	9
2.5.3 ORGANIZATIONAL MANAGEMENT STRUCTURE VS CONTRACTOR ASSURANCE.....	10
3.0 RISK MANAGEMENT	10
4.0 PERFORMANCE MANAGEMENT	10
4.1 PLANNING	10
4.2 ASSESSMENTS	10
4.2.1 CORPORATE ASSESSMENTS.....	11
4.2.2 EXTERNAL ASSESSMENTS.....	11
4.3 PERFORMANCE MEASUREMENT.....	11
4.4 ISSUES AND CORRECTIVE ACTIONS MANAGEMENT	12
4.5 FEEDBACK AND IMPROVEMENT	12
4.5.1 WORKER FEEDBACK.....	12
4.6 LESSONS LEARNED.....	12
4.7 PERFORMANCE REPORTING	12
4.7.1 BENCHMARKING	13
5.0 OPERATIONAL INTERFACES	13
5.1 CA PROGRAM APPROVAL AND CHANGE CONTROL	13
6.0 REFERENCES	14

Contractor Assurance System Description

1.0 Introduction

Fermi National Accelerator Laboratory (Fermilab) is managed and operated by Fermi Research Alliance (FRA), LLC, under Contract DE-AC02-07CH11359 (prime contract) with the U.S. Department of Energy's (DOE's) Office of Science (SC). The prime contract Clause H.13-*Contractor Assurance System* requires FRA to develop a Contractor Assurance System (CAS) that is executed by the contractor's Board of Directors. The Contractor Assurance System, at a minimum, shall include the following key attributes:

1. A comprehensive description of the assurance system with processes, key activities, and accountabilities clearly defined.
2. A method for verifying/ensuring effective assurance system processes. Third party audits, peer reviews, independent assessments, and external certification (such as VPP and ISO9001 or ISO 14001) may be used.
3. Timely notification of the DOE-Fermi Site Office (FSO) Contracting Officer of significant assurance system changes prior to changes.
4. Rigorous, risk-based, credible self-assessments, and feedback and improvement reviews to assess and improve Fermilab's work process and to carry out independent risk and vulnerability studies.
5. Independent verification and correction of negative performance/compliance trends before they become significant issues.
6. Integration of assurance system with other management systems including Integrated safety Management (ISM).
7. Metrics and targets to assess performance, including benchmarking of key functional areas with other DOE contractors, industry and research institutions. Assure development of metrics and targets that result in efficient and cost effective performance.
8. Continuous feedback and performance improvement.
9. An implementation plan (if needed) that considers and mitigates risks.
10. Timely and appropriate communication to the FSO Contracting Officer, including electronic access, of assurance related information.

CLAUSE H.13 – CONTRACTOR ASSURANCE SYSTEM

- (a) The Contractor shall develop a contractor assurance system that is executed by the Contractor's Board of Directors (or equivalent corporate oversight entity) and implemented throughout the Contractor's organization. This system provides reasonable assurance that the objectives of the contractor management systems are being accomplished and that the systems and controls will be effective and efficient. The contractor assurance system, at a minimum, shall include the following key attributes:
- (1) A comprehensive description of the assurance system with processes, key activities, and accountabilities clearly identified.
 - (2) A method for verifying/ensuring effective assurance system processes. Third party audits, peer reviews, independent assessments, and external certification (such as VPP and ISO 9001 or ISO 14001) may be used.

1.1 Purpose

The purpose of this document is to describe how the FRA and Fermilab's current and proposed management programs, processes, and procedures work in concert to form a comprehensive CAS that meets the requirements of the prime contract.

1.2 Scope

CAS applies to all work activities and to all personnel performing work at Fermilab including subcontractors and guests. The CAS process encompasses all aspects of the eleven cross-cutting management systems which are essential to mission success.

2.0 Assurance Process

FRA and Fermilab view contractor assurance as a laboratory-wide initiative and the primary tool for demonstrating that operations are compliant with legal and contract requirements. Contract Assurance is pending integration across all contract activities.

2.1 Roles

Each level of management has a distinct role and focus on the Contractor Assurance System:

The **FRA Board of Directors (BOD)** has the responsibility for governing Fermilab operations in accordance with the letter and intent of the contract between FRA and DOE. In performing their role, their actions are designed to achieve the following:

- Select, appoint, and support a chief executive to whom responsibility for the administration of the organization is delegated.
- Review and evaluate the chief executive's performance regularly. Govern the organization by broad policies and objectives that are formulated by the chief executive.
- Insure appropriate management of DOE supplied resources for the organization's operations
- Account to the stakeholders and public for the management and work activities of the organization.

The **Fermilab Director, Deputy Director and Chief Operating Officer** are the bridge between the Laboratory and the Board of Directors. Their primary responsibility is to carry out the strategic plans and policies as approved by the Board of Directors and by DOE.

The **Director, Deputy Director and Chief Operating Officer** are accountable to the board for:

- Contributing to the development of annual goals and objectives;
- Ensuring that procedures and overall management are designed in accordance with established board policy;
- Informing the Board of existing or impending policy issues; and
- Issuing an assurance declaration to the DOE that describes the compliance status of requirements defined by the Management and Operations contract for the laboratory.

The **Fermilab Management System Owners** are responsible for the day- to-day oversight and management of the eleven defined management systems. Their primary focus is ensuring that all elements of each management system are applied as appropriate across the laboratory.

The **Fermilab Associate Laboratory Directors** are responsible for the day-to-day management of the laboratory. Their primary focus is ensuring Accomplishment of the mission as defined by the strategic plan for the laboratory.

The **Fermilab Division, Section and/or Center (D/S/C) Heads** have day-to-day management responsibilities that include managing and directing specific projects or tasks.

Councils and Committees:

The **FRA CAS Committee** advises the FRA BOD on issues related to the implementation, adequacy, and improvements of CAS at Fermilab.

The **Laboratory Assurance Council (AC)** provides assurance to the Laboratory Director that the Fermilab Integrated Contractor Assurance System provides sufficient internal control and that oversight systems are in place and operating properly. The Assurance Council also provides oversight of issues management.

2.2 Corporate Governance

The University of Chicago (UChicago) and Universities Research Association, Inc. (URA) joined together to create Fermi Research Alliance, LLC (FRA). FRA, a limited liability company (LLC), was established for the sole purpose of managing and operating the Laboratory in accordance with the prime contract with the DOE.

2.2.1 Board of Directors

The FRA Board of Directors (BOD) is appointed by the partners of FRA, LLC to manage and oversee operations of the Laboratory. The FRA Board Chairman provides the DOE with single-point point of contact for communications with FRA. The BOD consists of the Chairman of the Board, who is currently the President of UChicago; a Vice-Chair, who currently is the Executive Chairman of the URA Board of Trustees; and twenty two additional members drawn from industry, government, academia, research and other leadership positions. The Director of the Laboratory is appointed by the BOD with the approval of the DOE. The Laboratory Director reports to the FRA BOD Chairman and the Board of Directors. The Laboratory Director is responsible for the direction, performance and supervision of the work of the Laboratory in accordance with the prime contract with the DOE and the policies and procedures of the Board of Directors.

The duties, powers, and governance of the BOD focus primarily in the following areas:

- Stewardship: UChicago and URA provide “corporate reach back” either to deal with specific, urgent issues or issues where the Laboratory can benefit from the unique resources of one or both corporate parents.
- Guidance and Advice: The BOD assists and advises the Director in formulating a laboratory strategy that is embraced by DOE and the U.S. HEP community. University and U.S. laboratory leaders on the BOD insure that the laboratory provides an intellectual environment conducive to world-class research and development. Expert advice from industry, government, and academia to assist the Director and his leadership team in ensuring that best practices are introduced and that infrastructure, staffing and budget are appropriately established and maintained.
- Advocacy and Outreach: Members of the BOD serve as advocates and ambassadors on behalf of the Laboratory to help ensure adequate support is available for execution of the Laboratory mission.

2.2.2 BOD Committees

FRA executes its stewardship function through the full BOD and (a) BOD Committees whose charter, membership and scope are defined by the BOD and which meet at regular meetings of the BOD; and (b) Standing Review Committees which meet according to their individual timetables to assess the operations and scientific programs of the Laboratory and provide assurance to the BOD. There are at present seven BOD Committees (four of which have direct oversight of Laboratory functions):

- Executive – provides executive leadership for the BOD and acts as a proxy for the full Board;
- Administrative & Finance – oversees the management of fiscal and operational systems, and manages Laboratory-wide non-scientific risk issues;
- Audit – oversees the internal and external audit function;
- Compensation – oversees human resource systems as well as compensation and succession planning for key personnel;
- Environment, Safety & Health – oversees Laboratory policies, programs, and practices relevant to employee, customer and public safety and health;
- Physics - oversees the present and short-term scientific functions of the Laboratory including all scientific activities, evaluation of scientific risk, and management of research facilities;
- Science Planning - provides advice and support to Laboratory management for issues surrounding new and proposed, long-term major science initiatives, directions and collaborations (international & domestic)

The full BOD and the BOD Committees generally meet every four months (February, June, and October). At each full board meeting, strategic topics are presented to the BOD, as they are responsible for periodic review of the strategic plan. Performance data, DOE requirements, the findings and the Laboratory's response to specific programmatic (i.e., science and technology) and operational reviews are disseminated in full board meetings. Staff members from Laboratory management and FRA support each BOD committee by documenting, monitoring, and facilitating the execution of action items from each meeting.

There are presently two Standing Review Committees of the BOD, one of which assesses the scientific mission of the Laboratory (Visiting Committee for Scientific Programs) and one which is responsible for Contractor Assurance (CAS Review Committee) – See Figure 1.

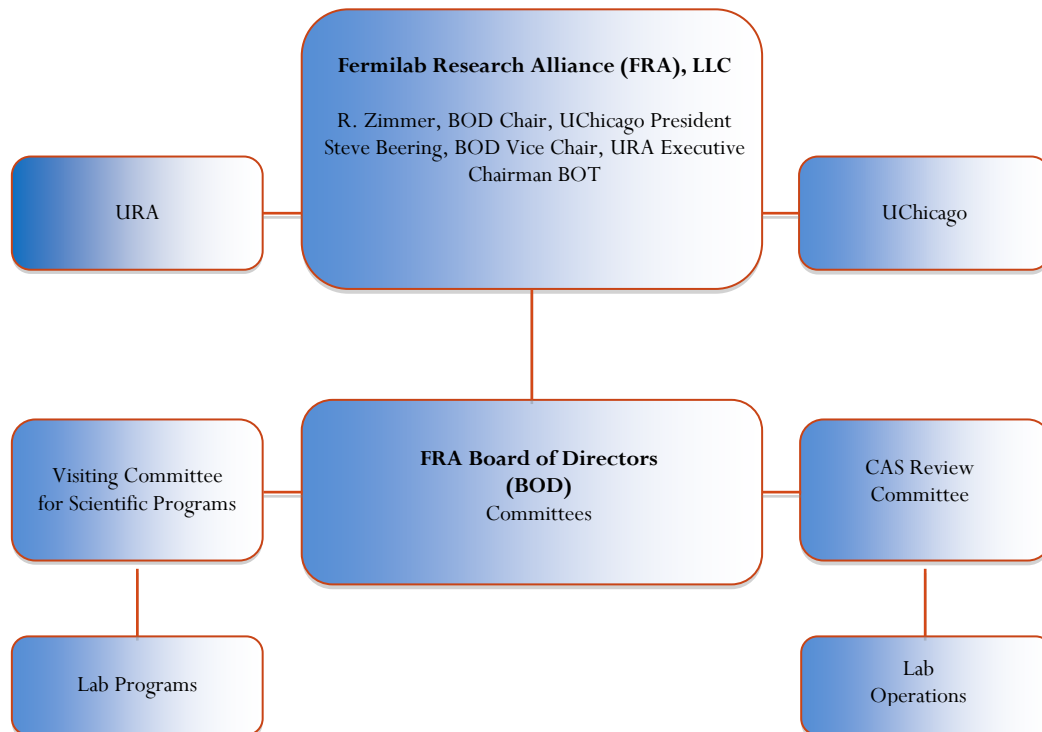


Figure 1: Corporate Governance Organization Chart

Each Standing Review Committee has two members of the BOD and a sufficient number of subject matter experts to assess the relevant area(s) adequately. Review Committee members have staggered terms to ensure an appropriate balance of continuity and turnover. In collaboration with FRA and the Laboratory Director, the charge and scope of each review are determined by the Standing Review Committee Chair; and Review Committee meetings and assessments are conducted at least once annually. After a Review Committee assesses performance, findings and recommendations are reported first to Laboratory management. Reports are shared and discussed with the full BOD at a subsequent Board meeting. FRA Board of Directors staff coordinates the reviews and are responsible for capturing

action items and tracking and reporting resolution of action items and final outcomes. The FRA Review Committee process is illustrated in Figure 2.

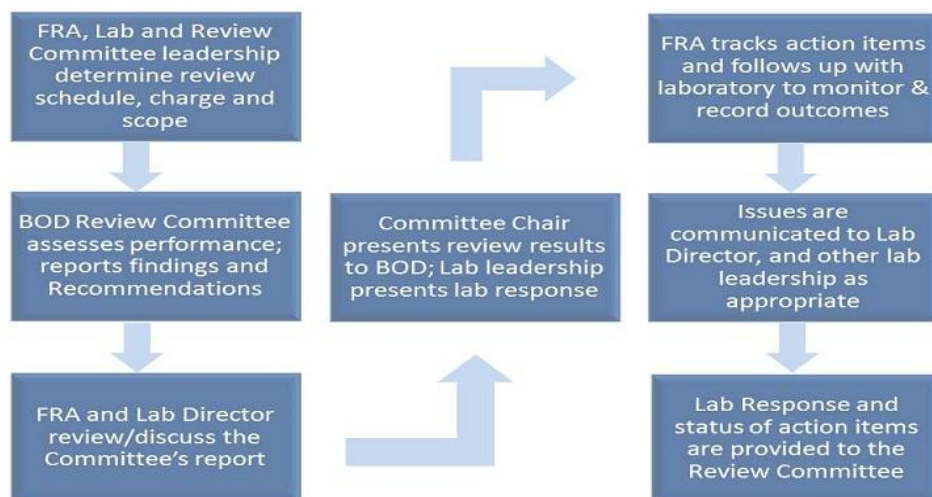


Figure 2: BOD Review Committee Assessment Process

2.3 Contractor Assurance Review Committee

The BOD CAS Review Committee is comprised of two BOD members and three to four additional subject matter experts (SMEs) with staggered terms to ensure an appropriate balance of continuity and turnover. The initial BOD members include the Chair and a member of the Administrative and Finance Committee, both of whom closely coordinate with the other committees, including the Environment, Safety and Health Committee.

The CAS Review Committee functions as an extension of the FRA BOD and provides: 1) expert assurance to the Board that the Laboratory has a robust and effective CAS in place; and 2) advice and assistance to the Laboratory in identifying and managing issues related to its CAS and helping the Laboratory prepare for periodic external CAS peer reviews. The CAS Review Committee meets as often as necessary to insure adequate performance of its primary function.

The Chair of the CAS Review Committee is required to present results of the CAS review(s) once annually to the full BOD. BOD members who serve on the CAS Committee are available to answer additional questions and provide Board perspectives

2.4 Partnership with DOE

The Fermi Site Office and The Director of the laboratory have signed a Partnership Agreement to formally declare their commitment to work in full partnership to achieve the mission of the laboratory and fulfill their responsibilities to the public, our employees, the scientific community, and the American people. A key element of the implementation of this agreement is clear and concise communication.

2.4.1 Timely and Appropriate Communication

In order to facilitate timely and appropriate communication to the DOE Site Manager, Contracting Officer and other appropriate DOE staff, FRA and the Laboratory have developed an internet-based repository of CAS-related information (<http://www.fnal.gov/pub/cas>). The repository includes detailed information utilized by the CAS Committee in conducting its assessments, and reports generated by the Committee and reported to the BOD. In addition, senior leadership provides routine verbal CAS updates to DOE

leadership throughout the year. FRA routinely provides access to and shares management information with the DOE through a combination of informal and formal mechanisms. Senior leadership of FRA conducts standing and impromptu meetings throughout the year with the DOE Fermilab Site Office (FSO) to provide information, obtain input, feedback and address issues as they arise. UChicago and URA also meet by phone and in person as necessary with appropriate DOE officials at Office of Science headquarters for the same purposes.

2.5 Laboratory Management of Contractor Assurance

Fermilab's management is comprised of two main elements: line management and process management. Line management determines what Fermilab will do. The process management system, tells employees how to accomplish activities needed to get work done. The combined effort is focused on achieving Fermilab's science mission in an efficient and effective manner.

2.5.1 Fermilab Management Structure

Fermilab operates under a line management structure, a hierarchical chain of command from the Laboratory Director down to front-line employees. Fermilab's line management structure provides clear roles, responsibilities, authorities, and accountabilities (R2A2's) for our workforce so that work at the Laboratory can be directed and conducted in an efficient manner.

The Directorate organization chart is shown in Figure 3:

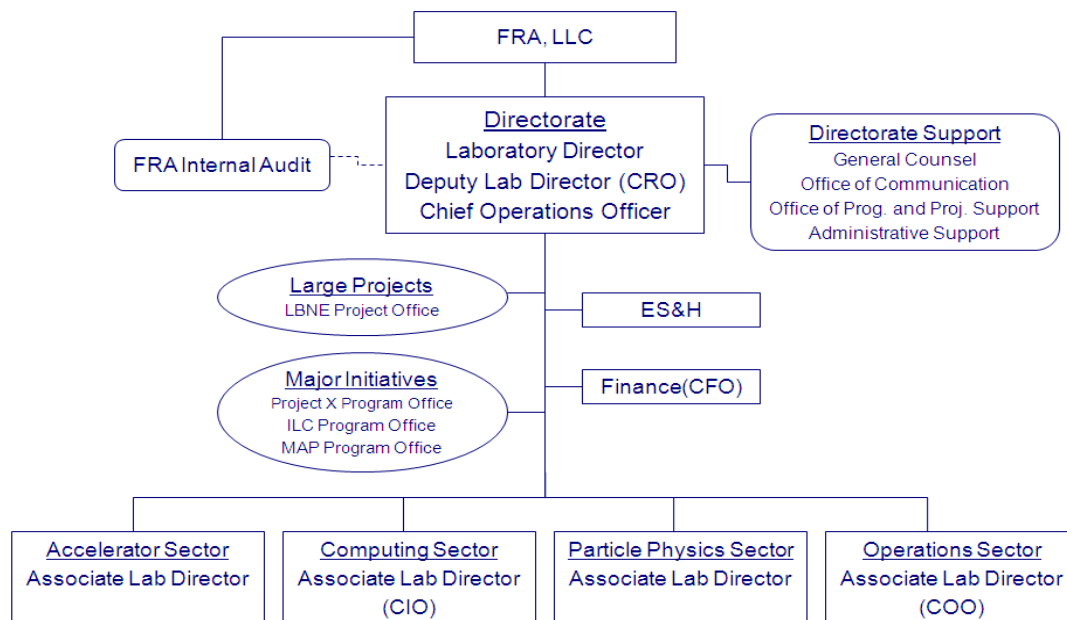


Figure 3: Fermilab Organization

2.5.2 Contractor Assurance and Management System Integration.

Uniform management system integration ensures efficiency and/or effectiveness across laboratory organizations.

- Vertical integration is facilitated by the downward flow of information regarding expectations for management system and program implementation. Vertical integration begins with management and continues down through the organization lines to the individual worker.
- Horizontal integration provides parity and compatibility to avoid conflicting requirements among organizations and technical disciplines.
- Assurance systems are either part of a management system or stand-alone program and comply with the Fermilab Director's Policy Manual.

ORG \ MSO	FRA	Directorate	Operations Sector	ES&H	Finance	Accelerator Sector	Particle Physics Sector	Computing Sector
Corporate Governance	O							
Performance Planning		O						
Science		O						
Finance					O			
Business Operations			O					
ES&H				O				
Quality		O						
Engineering		O						
Information Technology								O
Communication		O						
Stakeholder Relations		O						

O = Management System Owner

Figure 4: FRA/Fermilab Management Systems

2.5.3 Organizational Management Structure Vs Contractor Assurance

The director is responsible for all programs and delegates to the Office of Quality and Best Practices (OQBP), a part of the Office of Program and Project Support (OPPS), the day-to-day management of the Contractor Assurance Program. Operation of the Contractor Assurance Program consists of several major components with clear, documented descriptions of activities. Managers understand the description of their responsibilities, and a clear plan of key activities has been developed. OQBP coordinates site-wide assessment activities for the Contractor Assurance Program to assure the highest risk processes are included. Functional organizations provide assurance information in the form of assessment reports and metrics. Assessment reports are reviewed for breadth, depth and consistency, and feedback is provided to the functional organizations.

2.5.4 Contractor Assurance Oversight within the Laboratory

Oversight of the FNAL CAS system is provided by the Assurance Council. The Assurance Council is chaired by the Chief Operating Officer and its membership includes the Associate Laboratory Directors, key CAS management system owners and subject matter experts. The AC charter and other information on its activities is found at (<http://www.fnal.gov/pub/cas>). Additional information concerning the operation of the AC may also be found in Section of 4.4 of this document.

3.0 Risk Management

The Laboratory is establishing an Enterprise Risk Management program using a graded approach to provide assurance regarding the mitigation of risk.

This process will require identification and communication of potential events that may significantly impact the Laboratory negatively and then managing these identified risk events to an acceptable level. It will emphasize managing risk across the enterprise using common methods and advocates integrating risk management functions to improve performance.

4.0 Performance Management

Performance management includes the planning, assessing, measuring, and improving laboratory programs and operations.

4.1 Planning

Strategic and tactical planning for Fermilab is conducted by the Director, with advice from off-site advisors including the Director's Physics Advisory Committee, Office of High Energy Physics, and the High Energy Physics Advisory Panel and internal bodies, such as the Fermilab Assurance Council, Directorate, and OPPS

4.2 Assessments

Fermilab uses a combination of Management Assessment and Independent Assessment to ensure the requirements and controls applicable to the laboratory are satisfied:

- **Management Assessments:** Management Assessments at Fermilab are conducted by, or under the direction of, Fermilab managers at all levels, to identify and correct problems that hinder their organizations from achieving their objectives or to identify opportunities for improvement. These include assessments sponsored by Fermilab management such as third party certification assessments.
- **Independent Assessments:** Independent Assessments at Fermilab are audits, surveillances, verification and validation reviews, or inspections sponsored by the Office of Quality & Best Practices and led by OQBP staff. Independent assessment teams may include others who are independent are independent from the work or process being evaluated.

- **Surveillances:** Surveillances are a subset of Independent Assessments that include more routine and more frequent assessments that do not warrant the same level of rigor and formality as an audit. Typically they are led by QQBP staff, but may be led by others as directed by Fermilab management.

4.2.1 Corporate Assessments

Corporate oversight is accomplished by FRA principally through its Board of Directors and its BOD Committees as described in Sections 2.3. An additional level of corporate level assessment is executed by the Laboratory Internal Audit department. The Internal Auditor manages a comprehensive program of reviews designed to ensure adequate, cost-effective financial and operating controls. Also, the FRA CFO functions as the liaison to the BOD Audit Committee, and in conjunction with the Laboratory Internal Audit department, routinely reports the results of audits and other issues to that BOD Committee.

4.2.2 External Assessments

External certification audits to the OHSAS-18001 and ISO14001 standards are completed by an International Organization for Standardization (ISO) registrar. The registrar conducts external audits of the Laboratory Management System twice a year and recertification audits every three years. Other assessments are performed by organizations such as the IG, DOE, and GAO,

4.3 Performance Measurement

Performance measures are used to demonstrate sustained and improved performance relative to defined outcome measures and targets. Leading indicators are used, where possible, to monitor performance. Performance measures are aligned with strategic goals. Periodic reporting of status against metrics is provided to FSO and key stakeholders. The elements of Performance Measurement are outlined in Figure 5.

Steps	Elements
Establish Objectives and Measures	<ul style="list-style-type: none"> • Strategic Plan • Performance Evaluation and Measurement Plan • Management System objectives and measures • Project deliverables per Critical Decision step • EVMS thresholds • Line management goals / employee performance appraisals
Collect Data	<ul style="list-style-type: none"> • Assessments • Incident Investigations • Worker feedback • Lessons learned from others • Benchmarking / Peer Reviews
Track Performance	<ul style="list-style-type: none"> • Issues tracking system • Financial management systems • Human resources / performance appraisal process • Lessons Learned database
Report Results	<ul style="list-style-type: none"> • Periodic Lab Agenda and PEMP performance reporting • Management Reviews • Committee reports • ORPS reporting system • NTS reporting system • Employee performance appraisals • Lessons Learned bulletins

Figure 5: Elements of Performance Measurement

4.4 Issues and Corrective Actions Management

Issues management is utilized to ensure that significant items requiring the Directorate's involvement and/or commitment on resources, problems, trends, and issues are identified, documented, analyzed, and prioritized to promote effective resolution in a timely manner.

Issues management applies to issues identified through contractual obligations, corrective actions, assessments, lessons learned, and worker feedback, as well as injury, incident, and event (mishap) reporting which tend to be of major consequence, need lab-wide attention, and/or need senior management involvement. Fermilab's Issues Management System (IMS) utilizes a centralized spreadsheet system to track, manage, and report the status of identified issues

4.5 Feedback and Improvement

Feedback and improvement systems are used to drive continuous improvement across the operation. Trends in performance are analyzed to identify opportunities for improvement in both performance and risk reduction. Periodic reporting of status against metrics is provided to FSO and assurance program data is also available outside of formal reporting making the process transparent to all stakeholders.

4.5.1 Worker Feedback

Fermilab promptly addresses employee concerns about environment, safety, health, security, fraud, waste, abuse, or mismanagement of DOE and Fermilab managed activities. Resolution of employee concerns/complaints about environment, safety and health issues is expected to occur at the lowest management level possible.

4.6 Lessons Learned

The Fermilab lessons learned program is described in Lessons Learned Program (LLP), which establishes the processes that do the following:

- Ensure identification, documentation, validation, and dissemination of a lesson learned.
- Ensure utilization and incorporation of processes that includes identification of applicable lessons learned, identification of actions that will be taken as a result of the lesson learned, and follow-up to ensure that the identified actions were taken.
- Ensure measurement of operational performance improvement and program effectiveness.

The QQBP serves as the Fermilab LL Coordinator and has the responsibility for the program. The program coordinator performs an initial review and, if the lesson has the potential for use at Fermilab, contacts the appropriate person for the review.

4.7 Performance Reporting

Management assesses performance via indicator data routinely and uses the outputs of the Management Review as a basis for process improvement. The performance indicator data is considered in allocating resources, establishing goals, identifying performance trends, identifying potential problems, and applying lessons learned and good practices. Problems with performance are identified and corrected at the earliest possible stage. Areas where performance excels are examined for potential application elsewhere.

4.7.1 Benchmarking

Fermilab will perform benchmarking where requested by reviewers or line management to assess best practices and gain insights into practice by others. Fermilab performance data is used during the benchmarking process and it is compared against other sites within the DOE complex or commercial practices as deemed appropriate.

5.0 Operational Interfaces

Operational interfaces are designed to assure customer transparency, a key element of the Contractor Assurance System. Transparency is defined as timely, broad, and appropriate communication between Fermilab, FRA and the FSO to establish credibility in the Contractor Assurance (CA) processes. Transparency means unfettered access, within established protocols, to Fermilab's facilities and information about Laboratory operations in all areas.

5.1 CA Program Approval and Change Control

The minimum review cycle for this FRA Contractor Assurance System Description is annual or whenever new contract requirements affect the assurance programs. This description is also modified if lessons learned throughout the laboratory indicate a need for revision.

The Office of Quality and Best Practices (OQBP) and the AC review all revisions other than minor editorial changes. If a review results in revisions, the OQBP will resubmit the revised Contractor Assurance System Description to the DOE for review and approval. Any changes will be identified and explained, and the OQBP will provide the basis for concluding that the revised system description continues to satisfy requirements. If no revisions are made, the DOE will be notified that a review was conducted and that no revisions were necessary.

6.0 References

Fermi National Laboratory Prime Contract, Contract No. DE-AC02-07CH11359, Clause H.13 - *Contractor Assurance System*

DEAR Clause 970.5204-2, *DOE Management and Operations Contracts*, "Laws, Regulations, and DOE Directives"

DOE G 414.1-1B, *Management Assessment and Independent Assessment Guide*

DOE M 450.4-1, *Integrated Safety Management System Manual*

DOE O 231.1A, *Environment, Safety and Health Reporting*

DOE O 414.1C, *Quality Assurance*

Title 10 CFR Part 830, Subpart A, *Quality Assurance Requirements*

Title 10 CFR Part 851, *Worker Safety and Health Program*

DOE P 450.4, *Safety Management System Policy*

DOE P 450.5, *Line ES&H Oversight Policy*

DOE G 414.1-2A, *Quality Assurance Management System Guide for Use with 10 CFR 830 Subpart A*

DOE Order 151.1C, *Comprehensive Emergency Management System*

DOE Order 205.1A, *Department of Energy Cyber Security Management Program*

DOE Order 231.1A *Environmental, Safety and Health Reporting*;

DOE O 470.2B, *Independent Oversight and Performance Assurance Program, Attachment 2*

Fermilab Integrated Quality Assurance Program

Fermilab Director's Policy Manual, policy number 39, Assurance Program

Links: <http://www.fnal.gov/pub/cas>